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ANNUAL REPORT OF PROGRESS, 1964 - 1965

FEDERAL AID IN FISH RESTORATION PROJECT F-5-R-6

SPORT FISH INVESTIGATIONS OF ALASKA

ALASKA DEPARTMENT OF FISH AND GAME  
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## INTRODUCTION

This report of progress consists of Job Segment Reports from the State of Alaska Federal Aid in Fish Restoration Project F-5-R-6, "Sport Fish Investigations of Alaska."

The project during this report period is composed of 23 separate studies designed to evaluate the various aspects of the State's recreational fishery resources. Of these, eight jobs are designed to pursue the cataloging and inventory of the numerous State waters in an attempt to index the potential recreational fisheries. Four jobs are designed for collection of specific sport fisheries creel census while the remainder of the jobs are more specific in nature. These include independent studies on king salmon, silver salmon, grayling, Dolly Varden, a statewide access evaluation program and an egg take program.

A report concerning the residual effects of toxaphene accumulates the findings of a three-year study. The report presented here terminates this segment and is a final report. The information gathered from the combined studies will provide the necessary background data for a better understanding of local management problems and will assist in the development of future investigational studies.

The subject matter contained within these reports is often fragmentary in nature. The findings may not be conclusive and the interpretations contained therein are subject to re-evaluation as the work progresses.

JOB COMPLETION REPORT  
RESEARCH PROJECT SEGMENT

State: Alaska Name: Sport Fish Investigations  
of Alaska

Project: F-5-R-6 Title: Investigations of the Upper  
Southeast Alaska Salt Water  
Sport Fish Harvest

Job No.: 3-D

Period Covered: May 1, 1964 to August 30, 1964

ABSTRACT

This report covers the findings of the saltwater creel census conducted in the Juneau area from May 1, 1964 to August 30, 1964. The creel census included sport anglers and sport-gear commercial anglers.

A total of 6,903 salmon, representing 2,366 boat trips, was sampled during the regular fishing season. An additional 2,172 salmon were censused during the annual salmon derby. Pertinent fishery and biological data were collected and recorded from this catch. Seasonal timing and catch distribution are discussed.

Aerial boat counts were used to estimate the total seasonal harvest of 19,175 salmon, which resulted from 6,572 boat trips. The seasonal success rate was 2.9 salmon per trip.

RECOMMENDATIONS

1. That this study be continued to assure the continuity of sport fish harvest data on which sound management recommendations may be based.
2. That a suitable statistical design be applied to the entire Southeast creel census program permitting the consolidation of findings and reports.
3. That the Juneau area creel census be increased in numbers to permit a more complete coverage of this exploding fishery.

## OBJECTIVES

1. To obtain a reasonable estimate of the species and numbers of sport fishes harvested in salt waters of the Juneau area.
2. To obtain an index of the size and age classes of the salt waters fished.

## TECHNIQUES USED

Background information from prior creel censuses conducted by the Alaska Department of Fish and Game was reviewed and utilized during this investigation.

The principal boat moorage facilities in the Juneau area were censused in a manner to produce the maximum number of angler interviews.

The census was conducted on three randomly selected weekdays and on every weekend day throughout the study period.

Fish migration patterns and angler usage were factors considered in selecting sampling areas.

Aerial boat counts were utilized to determine the number of boats on the fishing grounds. These counts were then used to determine what percentage of coverage the creel census crews were obtaining.

Biological data was obtained, when possible, by inspecting the catches of interviewed anglers.

Catch location, hours fished and methods employed were obtained by interview.

Recommendations are made for management measures and to direct the course of future studies.

## FINDINGS

Past Alaska Department of Fish and Game Dingell-Johnson Reports have illustrated the growth of saltwater recreational fishing in the Juneau area. This growth has resulted in a greater demand for data that can be utilized to properly manage this fishery. During 1964, a creel census similar to those of past years was conducted

on the Juneau area saltwater sport fishery to supply this necessary data.

### Seasonal Catch Success and Fishing Effort

The period covered by the creel census crew was from May 1 to August 30. Prior to May and after early September, sport fishing is severely restricted by adverse weather conditions. This period of the year contributes very little to the sport fish harvest and was not censused for this reason.

During the sampling period, 4,927 anglers were censused that had caught 6,903 salmon (Table 1). The annual Golden North Salmon Derby was censused separately and accounted for an additional 2,172 salmon. Derby fishing is treated as a separate unit of this report and is not used in computing seasonal figures.

Sport and sport-gear<sup>1</sup>ed commercial fishermen made 2,366 boat trips in the Juneau area in 1964. This resulted in a seasonal average of 2.92 salmon per boat trip. This success rate is the highest recorded for the 5 years this program has been conducted.

When the sport and sport-gear<sup>1</sup>ed commercial fishermen are compared, it is found the commercial angler catches nearly eight salmon to the sport angler's one. It has been theorized that this difference is due to the multiple gear allowed the commercial angler, his greater skill and the longer hours he fishes.

The seasonal sport catch of king salmon was 980 fish, recorded by censusing 1,697 boats. These figures give a calculated catch per sport boat trip of .58 king salmon. The sport-gear<sup>1</sup>ed commercial fisherman enjoyed a greater success, catching 1,849 kings during 669 boat trips for a seasonal catch rate of 2.76 king salmon per boat trip.

The seasonal catch per sport boat trip for coho salmon was 0.39, which is a sharp drop from the 0.71 reported in 1963. The commercial anglers did not experience this decline as their 1964 coho catch per boat trip of 4.65 compares favorably with the 4.95 catch rate reported in 1963. It should also be realized that the catch rate on this species would be much higher if computed for

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<sup>1</sup> Sport-gear<sup>1</sup>ed commercial fishermen are those who use typical sport fishing rods and reels and fish from small, pleasure-type boats and skiffs.

TABLE 1. - The numbers of Fish, Boats and Catch per Boat censused during 1964 in the Juneau area.

<u>Type</u>	<u>Species</u>	<u>No. Fish</u>	<u>CPUE*</u>
Sport (1,697 Boats)	King	980	.58
	Coho	670	.39
	Pink	55	.03
	<u>Chum</u>	<u>0</u>	<u>.00</u>
	TOTAL	1,705	1.00
Commercial (669 Boats)	King	1,849	2.76
	Coho	3,112	4.65
	Pink	226	.34
	<u>Chum</u>	<u>11</u>	<u>.02</u>
	TOTAL	5,198	7.77
Combined Sport and Commercial (2,366 Boats)	King	2,829	1.19
	Coho	3,782	1.60
	Pink	281	.12
	<u>Chum</u>	<u>11</u>	<u>.01</u>
	TOTAL	6,903	2.92

\* Catch per unit of effort per boat trip

TABLE 2. - Estimated Salmon Harvest during the 1964 Fishing Season, Juneau area.

<u>Species</u>	<u>Regular Season Sport Harvest</u>	<u>Derby</u>	<u>Commercial Rod &amp; Reel Harvest</u>	<u>Estimated Total Harvest</u>
King	2,722	624	5,136	8,482
Coho	1,861	1,246	8,645	11,752
Pink	152	297	629	1,078
Chum	0	5	30	35
Sockeye	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
TOTAL	4,735	2,172	14,440	21,347

the period when they are available instead of for the entire season.

The censused fishing effort for the season (excluding the Derby), based on the 3,904 sport anglers and 1,023 commercial anglers interviewed, was 26,839 man hours. This figure breaks down into 18,248 hours of sport fishing and 8,591 hours of commercial fishing. The catch per hour for sport anglers was .09 salmon while for commercial anglers the catch was .61 salmon per hour. These figures indicate that it took slightly more time for both the commercial and sport anglers to boat a fish in 1964 than it did in 1963.

A total of 2,366 boats was checked during the report period. A breakdown of this figure shows that 66.9 percent were censused during weekends and the remaining 33.1 percent were weekday fishermen. It was also found the weekend anglers spent 5.6 hours per trip while the weekday anglers accounted for only 3.8 hours per trip. This is felt to be the result of the "after work" nature of the weekday angling.

#### Estimated Seasonal Harvest

As there are many private moorages throughout the Juneau area, a census covering the entire fishery is impossible. To obtain the highest number of angler contacts possible, the census crews were stationed at the major commercial moorages. To determine the percentage of the fishing effort the crews were sampling, aircraft were employed on alternate weekend days to count the total number of boats on the fishing grounds. This air coverage was employed throughout the census period. The air counts indicated that the census crews were sampling 36 percent of the total fishing effort. Using this figure to expand the season's catch, it is estimated that 19,175 salmon were taken during the 6,572 boat trips. During the Derby 2,172 salmon were censused and are felt to closely represent the total catch for that event. Combining this figure with the estimated seasonal harvest gives an estimated annual catch of 21,347 salmon (Table 2).

#### King Salmon

King salmon are the most desired salmon entering the fishery. Their large size, fighting ability and delicious flesh have placed them first on the list of sought after fish. Two major stocks of these fish are available to Juneau area anglers - "spawners" and "feeders."

Spawners are large, mature fish on their way to the spawning grounds while "feeders" are smaller, immature fish which are found throughout the year in local salt water. As reported in previous years, the smaller "feeders" make up the bulk of the catch in that eight out of ten fish examined were immature.

Due to regulation changes, 1963 is the only previous year the king salmon catch can be directly compared with this report period. A full explanation of the regulation change can be found in "Volume 5, State of Alaska, Department of Fish and Game, Sport Fish Division, Dingell-Johnson Project Report, 1963-64."

The 1964 censused king salmon harvest of 2,829 fish was the highest recorded since the study was initiated (Table 3). The catch per unit of effort is also the highest. It appears the regulation change, permitting the keeping of smaller fish, has added substantially to the catch.

#### Timing of the Various Species into the Fishery

Only king salmon were caught in appreciable numbers until late June when silver salmon began entering the fishery. Pink salmon were last to enter the catch with these fish appearing during the last week of June (Figure 1).

Fishing success for king salmon, measured by numbers of fish censused, exhibited an unsteady growth until the third week of July when a peak of 643 fish was censused. This peak corresponds exactly with the 1963 peak. After this high the catch steadily declined throughout the remainder of the census period.

Coho salmon began entering the catch in significant numbers in mid-June and eventually built to a peak in early August. The coho catch provides the backbone of the fall fishery, as Figure 1 illustrates.

Pink salmon entered the fishery in late June and steadily increased throughout the remainder of the census period.

Chum salmon entered the catch only 11 times throughout the season and are not considered important to the fishery.



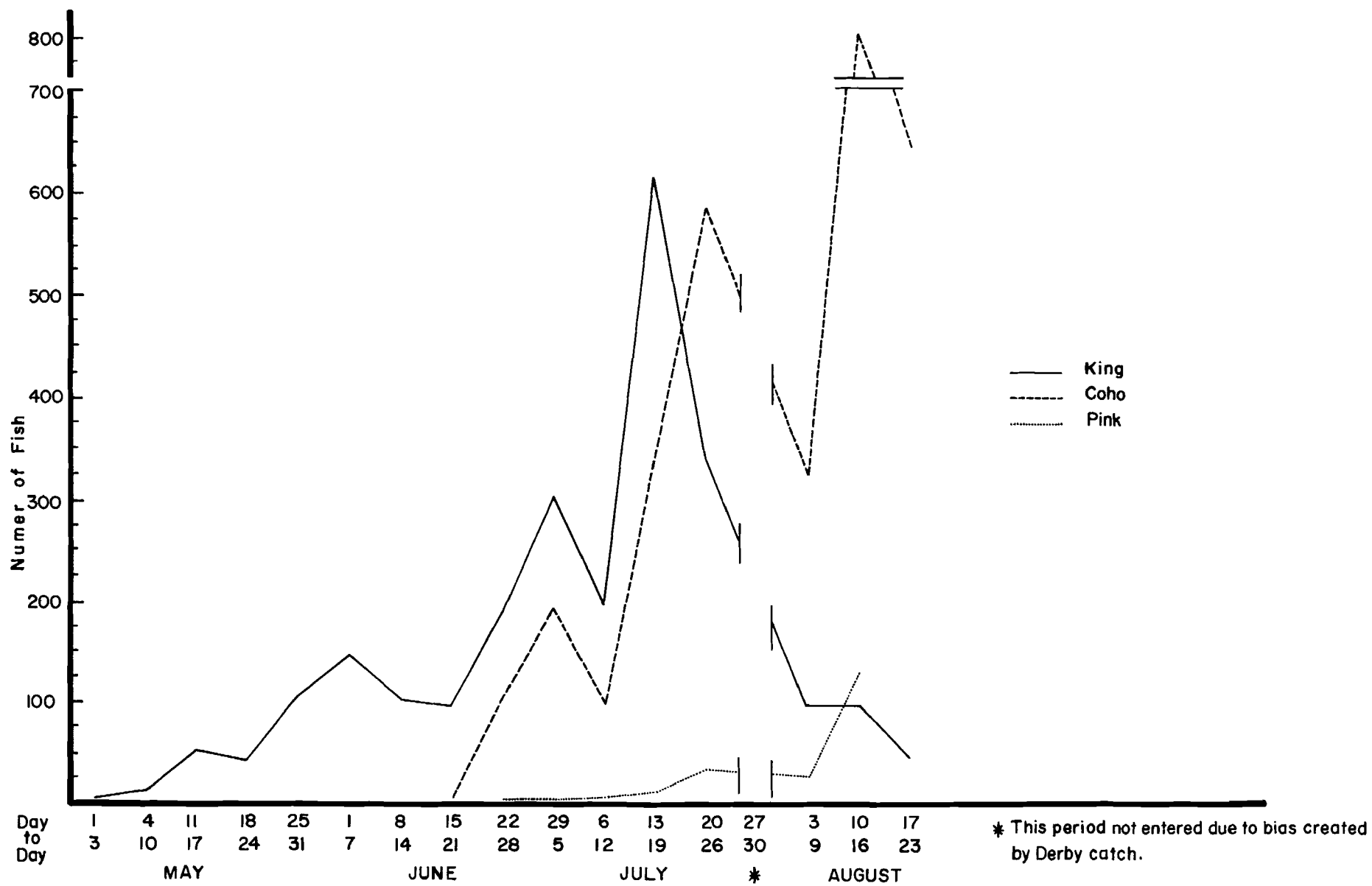


Figure I. Total Recorded Salmon Catch by Week.

TABLE 3. - Catch per Boat for Sport and Rod and Reel Commercial Fishermen for the Years 1960-1964.

Year	Boats	King		Coho		Pink		Chum	
		#Fish	CPUE	#Fish	CPUE	#Fish	CPUE	#Fish	CPUE
1960	1,840	1,637	0.89	1,442	0.78	97	0.05	16	0.01
1961	1,523	837	0.55	1,104	0.72	78	0.05	18	0.01
1962	1,557	655	0.42	1,641	1.05	68	0.04	31	0.02
1963*	2,560	2,396	0.95	4,271	1.70	150	0.05	53	0.02
1964*	2,366	2,829	1.19	3,782	1.60	281	0.12	11	0.01

\* Only years directly comparable due to regulation change.  
CPUE - Catch Per Unit of Effort Per Boat.

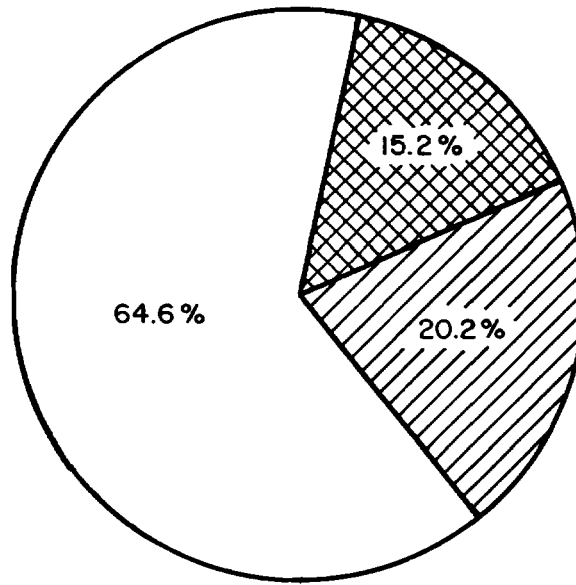
#### Success by Boat Type, Bait and Method

The 16-to 20-foot cabin boat remains the most popular in the Juneau area with 63.5 percent of the effort occurring from this size craft. Open skiffs under 20 feet accounted for 23.6 percent of the effort while the remaining 12.9 percent was from large cabin boats over 20 feet.

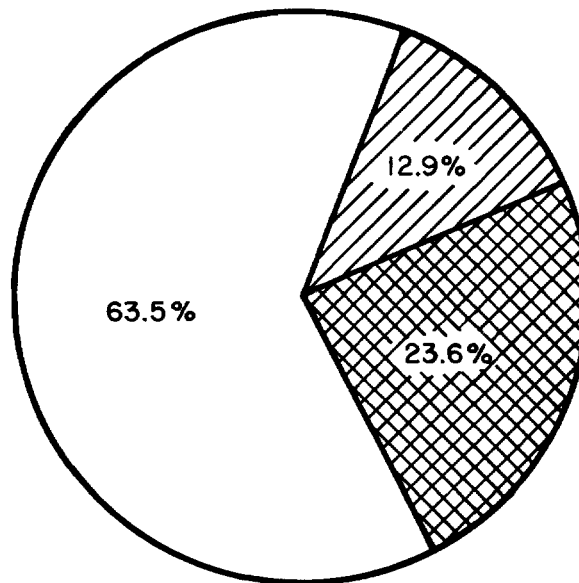
Success by boat types also showed the 16-to 20-foot cabin boats to lead as they reported 64.6 percent of the salmon landed. Large cabin boats accounted for 20.2 percent of the salmon with the open skiffs reporting the remaining 15.2 percent (Figure 2).

Baits used and methods of presentation were also tallied. The results showed fresh herring accounting for 65.4 percent of the salmon caught on fish baits with frozen herring catching the remaining 34.6 percent. Strip-cut herring, which is cutting a fillet from the fish's side, was by far the most effective rig as it caught 65.4 percent of the salmon as compared to 19.3 percent for whole herring and 12.6 percent for plug-cut herring. Lures, spoons and etc. accounted for only .7 percent.

Strip fishing, which is raising the bait in a series of jerks from near bottom, produced 50.9 percent of the salmon censused. Trolling produced 41.2 percent. The remaining 7.9 percent was caught mainly by mooching, which is trolling at alternate speeds to raise and lower the bait (Figure 3).



Catch by Boat Types



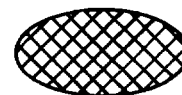
Boat Types Used



Cabin 16' to 20'



Open Less Than 20'



Large Cabin Larger Than 20'

Figure 2. Per Cent of Boat Types Used and Catch by Boat Types in The Juneau Area - 1964.

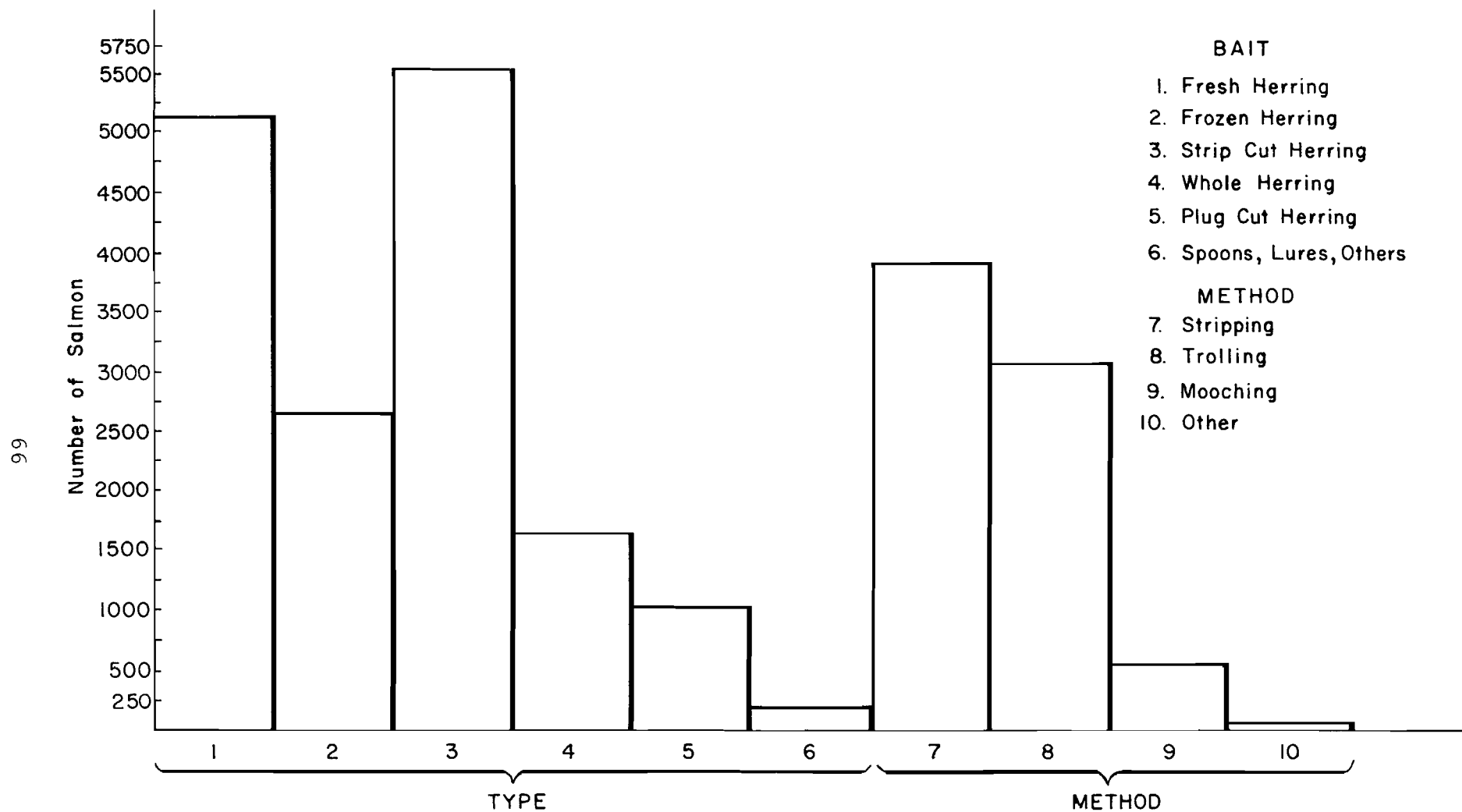


Figure 3. Fishing Success by Bait Type and Fishing Method

## Other Species

The only fish, other than salmon, which is sought to any extent by the Juneau anglers is halibut. During this report period a total of 397 of these fish was censused. The months of June and July were the top producers with 177 and 139 reported respectively.

Dolly Varden furnish incidental sport in that they are caught by anglers seeking salmon. A total of 113 was censused during the 1964 season.

Other fish entering the catch to a minor degree are sablefish (blackcod), flounders and sole, rockfishes and cod. Also caught but considered a nuisance by local anglers are whiting, sculpins and dog fish.

## Fish Sizes

During May and early June large king salmon predominate the catch. After this period the adult spawners leave the fishery and the immature "feeders" provide the bulk of the catch. Coho salmon enter the fishery in mid-June at slightly over 5 pounds dressed weight. They gradually increase in size throughout the remainder of the season until the final weight of just under 10 pounds is encountered.

Pink salmon weight varies between three and four pounds during their period of availability (Figure 4).

In Table 4 the size in centimeters and weight in pounds is given by weekly periods for king and coho salmon. This table again illustrates the larger size of the early arriving king salmon and late arriving coho salmon. The seasonal average size for king salmon was 73.1 centimeters (Table 5) with a range from 42 to 115 centimeters. Their average round weight was 11.5 pounds with a range from 3 to 54 pounds.

Coho salmon average length was 66.75 centimeters with a range from .5 to 16.5 pounds.

Pink salmon averaged 54.3 centimeters in length and 4.6 pounds in round weight.

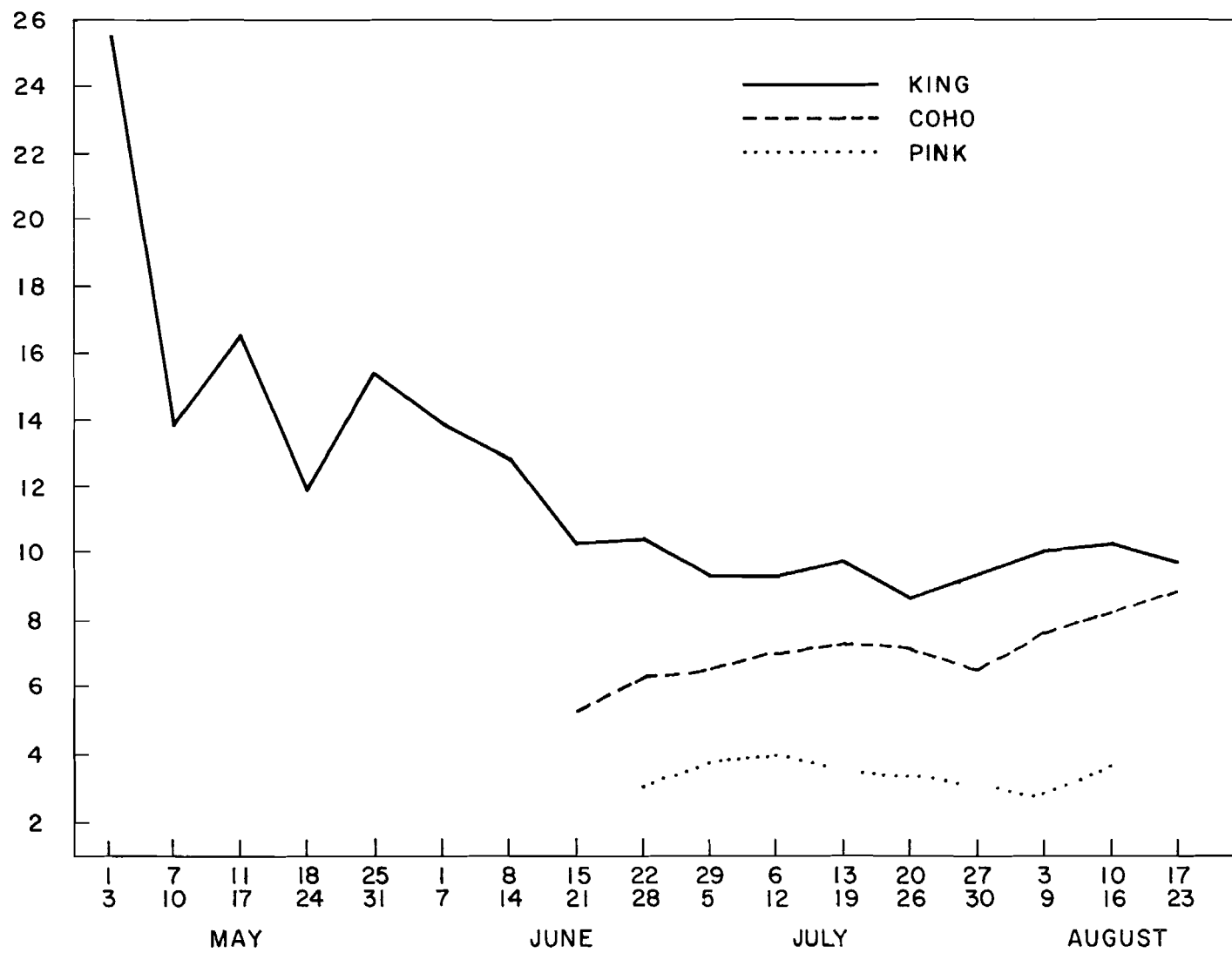


Figure 4. Weight of Dressed Salmon by Weekly Periods

TABLE 4. - Average Length and Round Weight of King and Coho Salmon by week

Weekly Period	King Salmon		Coho Salmon	
	Length (cm)	Weight (lbs)	Length (cm)	Weight (lbs)
<u>May</u>				
1-3	89.2	21.5		
4-10	85.0	27.5		
11-17	83.0	23.2		
18-24	81.5	27.2		
25-31	81.6	19.3		
<u>June</u>				
1-7	78.2	15.0		
8-14	76.2	13.3		
15-21	68.8	10.7	57.1	5.0
22-28	70.3	10.1	63.1	7.3
29-5	70.1	9.7	63.2	7.5
<u>July</u>				
6-12	71.3	11.7	64.8	8.2
13-19	70.8	9.6	65.7	8.6
20-26	67.9	8.5	68.0	11.2
27-30	69.2	6.0	63.3	--
<u>August</u>				
3-9	71.3	11.3	67.6	10.5
10-16	70.9	8.0	68.4	7.7
17-23	60.5	6.0	69.0	10.2

TABLE 5. - Average Length and Weights of Salmon for the 1964 Fishing Season, Juneau area

Species	Average Length* in centimeters	Average Round** Weight in Pounds	Average Dressed*** Weight in Pounds
King	73.1	11.5	11.1
Silver	66.75	9.5	8.0
Pink	54.3	4.6	3.45

\* Length - tip of snout to fork of tail  
 \*\* Round Weight - entire fish  
 \*\*\* Dressed Weight - gills and viscera removed

## Sex Ratio

The sex composition of the king salmon catch remained as recorded for past years. Males predominated during the first part of the season with females overtaking during the latter months. The seasonal breakdown gives 57 percent of the king salmon catch as female.

Coho salmon were found to be opposite with 58 percent of catch being comprised of males (Table 6).

Pink and chum salmon entered the catch so rarely, they were not considered in this aspect.

TABLE 6. - Sex Composition by Species for the 1964 Fishing Season, Juneau area

<u>Species</u>	<u>Sample Size</u>	<u>No. of Males</u>	<u>No. of Females</u>	<u>% Males</u>	<u>% Females</u>
King	405	174	231	43	57
Coho	137	80	57	58	42

## King Salmon Flesh Color

Red-fleshed king salmon remained predominate as in previous years comprising 58 percent of the catch. Of the 1,153 kings examined for flesh color, 666 were red and 487 were white. The red-fleshed kings are favored in the commercial catch as they demand nearly double the price of the white. Sport fishermen are split on their preference with many contending the white king is superior on the table due to its higher oil content.

It was also noted that the percentage of white-fleshed kings increased as the season progressed.

## 1964 Golden North Salmon Derby Results

The 1964 Salmon Derby sponsored by the Territorial Sportsmen, Inc., was held July 31 through August 2. The area open to derby fishing roughly comprises the northern half of the creel census area.

The rules established by the Territorial Sportsmen provided that all contestants must abide by the current Alaska Department of Fish and Game Sport Fishing Regulations.



Derby anglers were permitted to fish between the hours of 8:00 a.m. to 6:00 p.m. All fish are landed at official derby stations, one at Auke Bay and one at Tee Harbor. Fish were sampled by the census crew at these stations.

The results of the sampling are as follows:

#### A. Biological Factors

During the 1964 Derby 624 king, 1,246 coho, 297 pink and 5 chum salmon were recorded taken (Table 7).

TABLE 7. - Salmon Landed by Day and Location During the 1964 Juneau Salmon Derby

<u>Species</u>	<u>July 31</u>	<u>TEE HARBOR</u>		<u>Total</u>
		<u>August 1</u>	<u>August 2</u>	
King	68	84	56	208
Coho	103	203	157	463
Pink	11	42	33	86
Chum		2		2
<u>AUKE BAY</u>				
King	106	169	141	416
Coho	189	337	257	783
Pink	43	94	74	211
Chum	2		1	3
<u>COMBINED</u>				
King	174	253	197	624
Coho	292	540	414	1,246
Pink	54	136	107	297
Chum	<u>2</u>	<u>2</u>	<u>1</u>	<u>5</u>
TOTAL	552	931	719	2,172

King salmon averaged 10.4 pounds in weight and 68.5 centimeters in fork length. The largest king salmon taken was 36 pounds, 13 ounces.

Silver salmon averaged 9.4 pounds in weight and 64.9 centimeters in fork length.

Females and red flesh were found predominant in the king salmon recorded.

### B. Fishery Factors

The total number of anglers validated by derby officials was 4,920. The largest number of anglers validated in one day was 1,679 which occurred the second day of the derby (Table 8). The calculated catch per angler for the 3-day period was 0.44 salmon.

TABLE 8. - Number of Anglers Validated by Station. Juneau Salmon Derby, 1964.

<u>Date</u>	<u>Auke Bay</u>	<u>Tee Harbor</u>	<u>Total</u>
7-31	1,057	532	1,589
8-1	1,107	572	1,679
8-2	<u>1,157</u>	<u>495</u>	<u>1,652</u>
TOTAL	3,321	1,599	4,920

### C. Comparison with Past Derbies

The following table is presented to provide a comparison with past Juneau area derbies (Table 9).

TABLE 9. - Success of Juneau Salmon Derbies for the Years 1959 -64

<u>Species</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>
King	599	361	221	226	617	624
Coho	862*	650	551	490	695	1,246
Pink		19*		7	115	297
Chum				<u>10</u>	<u>12</u>	<u>5</u>
TOTAL	1,461	1,030	772	733	1,440**	2,172

\* This number includes other species of salmon

\*\* Includes one sockeye salmon

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